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EXAMINER

NGUYEN, DILINH P

ART UNIT PAPER NUMBER

2814

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/608,718

Applicant(s)

EMERY, RICHARD D.

Examiner

DiLinh Nguyen

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-10 and 31-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-37 is/are allowed.
- 6) ☒ Claim(s) 1,3-4,6-10 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

Claims 4, 6 and 31 are objected to because of the following informalities:

Line 1, claim 6, replace "a side of the die" with --the edge of the die--.

Line 3, claim 4, replace "the plate" with --the first plate--.

Line 5, claim 31, replace "the plate" with --the first plate--.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Horvath (U.S. Pat. 4415025) (previously applied).

Horvath discloses a semiconductor package comprising:

a die 12, the die comprising a first side, a second side, and an edge;

a first plate 24, the first plate coupled with the die, the first plate exerting force on the die to modify the effective coefficient of thermal expansion of the die; and  
a package, the die being coupled with the package (cover fig., column 3, lines 47-53).

- Regarding claim 6, Horvath disclose that the side of the die is coupled with a side of the first plate (cover fig.).

3. Claims 1, 4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (U.S. Pat. 6081037) (newly cited).

Lee et al. disclose a microelectronic device comprising:

the die 11, the die comprising a first side, a second side, and an edge;

a first plate 31, the first plate coupled with the die; the first plate inherently exerting force on the die (the edges 35 and 37 of the first plate 31 compress sidewalls of the chip 11) to modify the effective coefficient of thermal expansion of the die;

and a package 21, the die being coupled with the package (fig. 2, column 3, lines 20-29).

- Regarding claim 4, Lee et al. disclose that the first plate comprises a hole 34, the die fitting within the hole, the edge of the die being coupled with an edge of the first plate by the hole (fig. 2).
- Regarding claim 6, Lee et al. disclose that the edge of the die is coupled with a side of the first plate (fig. 2).

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Turner (U.S. Pub. 2002/0185728) (previously applied).

Turner discloses a semiconductor package comprising:

a die 2, the die comprising a first side, a second side, and an edge;

a first plate 5 or 6, the first plate coupled with the die, the first plate exerting force (F) on the die to modify the effective coefficient of thermal expansion of the die; and a package, the die being coupled with the package (fig. 1, paragraph 0002).

- Regarding claim 6, Turner discloses that the side of the die 2 is coupled with a side of the first plate (fig. 1).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horvath, Lee et al. or Turner in view of Zhang et al. (U.S. Pub. 20020171144) (previously applied).

Horvath, Lee et al. or Turner substantially discloses all the limitations as claimed above except for the first plate modifies the CTE of the die to make the CTE of the die more closely match the CTE of the package.

However, Zhang et al. discloses a semiconductor package comprising:

a die 102, the die comprising a first side, a second side, and an edge;

a first plate 502, wherein the first plate is a copper plate 502;

a substrate 104 and a second plate 504; wherein the substrate and the second plate are made of copper (paragraph 0043) and wherein the first plate modifies the CTE of the die to make the CTE of die more closely match the CTE of the package (fig. 5, paragraph 0065). Therefore, it would have been obvious to one having ordinary in the art at the time the invention was made to modify the device structure of Horvath, Lee et al. or Turner by having the CTE of the die more closely match the CTE of the package because as taught by Zhang, the CTE's match would minimize the mismatch of the thermal expansion coefficients of the package (paragraph 0065).

- Regarding claim 7, Zhang et al. disclose the package further comprising a second plate 504 coupled with the package (fig. 5, paragraph 0065).
- Regarding claim 8, Zhang et al. disclose that the package is attached with the second plate 504 by an adhesive 518 (fig. 5).
- Regarding claims 9-10, Lee et al. disclose that the first plate is constructed of copper (column 3, lines 15-17); Zhang et al. disclose that the first plate 502 and second plate 504 are constructed of copper (fig. 5, paragraph 0065).
- Regarding claims 9-10, Horvath discloses the first plate 24 is constructed of copper (column 3, lines 31-33); Zhang et al. disclose that the first plate 502 and second plate 504 are constructed of copper (fig. 5, paragraph 0065).
- Regarding claims 9-10, Turner discloses the first plate 5 or 6 is metallic material and it would have been obvious to select the metallic material is copper; Zhang et al. disclose that the first plate 502 and second plate 504 are constructed of copper (fig. 5, paragraph 0065).

***Allowable Subject Matter***

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 31-37 are allowed. See the examiner's statement of reasons for allowance in the previous office action.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DLN



HOAI PHAM  
PRIMARY EXAMINER